Research Article

Undergraduate medical students’ perceptions and opinions towards the subject of Physiology

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Abstract

Introduction: Medical doctors are an important source of teachers of basic sciences and are best poised to convey the clinical aspects of the subject. But studies from all over the globe are reflecting the disturbing trend of medical students less inclined to pursue a career in the basic sciences. The inclination of medical students towards any specialty/subject is determined by various variables among which the attitudes/opinions of the student towards the subject play a major part.

Aim & objectives: This study aims to ascertain the medical students’ opinions and attitudes towards physiology as a subject and as a future career choice.

Methods and Materials: A 15 item questionnaire was generated, administered to first year and final year students and the responses graded on a 5 point Likert scale. Statistical tests were used to compare the two groups.

Results: Physiology as a subject was overall perceived positively by both the groups, especially by the final year students. But both the groups exhibited very less inclination to take up physiology as a career.

Conclusion: Few medical students all over the world are interested in a career in basic science subjects; hence the need to address this apathy in the medical curriculum is critical. The physician/teacher is the most powerful influence upon the students and they should act to improve the outlook of the students. This study could be valuable guide to better designing of the curriculum and better faculty development and training in pedagogical approaches.

Keywords: Perceptions, Medical students, Physiology

1. Introduction

Human physiology is the science of the mechanical, physical and biochemical functions of human beings which lays the foundation of good clinical medical practice and is seen as an important core component of any medical curriculum. Today with the explosion of knowledge, new drugs being introduced, novel diagnostic and interventional techniques developed and a better understanding of how the genome alters functions, it is more and more critical for the present day medical students to understand the principles of both normal and abnormal Physiology. A lot of discussion has been generated on how much physiology to teach in the current scenario and how to make it more relevant to the students at the same time making sure that the basic physiological principles are adequately covered. 1,2,5,6

Attitude is an important concept that is often used to understand and predict people’s reaction to an object or change. It influences behavior and learning to a great extent. Social psychological research and cognitive psychology have shown that behavior and learning is sometimes unwittingly and inadvertently influenced by the perceptions of an individual.7 The inclination of medical students towards any specialty/subject is determined by various interacting variables amongst which the attitudes/opinions of the student towards the subject play a major part. 8,9

This often determines how well the students learn and understand the subject and consider it as a possible future career. Medical doctors are an important source of teachers of basic sciences and are best poised to convey the clinical aspects of the subject. 10 But studies from all over the globe are reflecting the disturbing trend, of medical students less inclined to pursue career in the basic sciences. 11,12,15-18 In fact physiology and other basic science subjects are at the lower rung in the spectrum of choices for future careers. 11,12

This study was undertaken with the main objective to ascertain and compare the medical students’ opinions and attitudes towards physiology as a subject and as a future career choice, which is taught for a period of one year during the first year of MBBS program in our medical college in the UAE.

This study also aims to enhance the awareness among students regarding the utility of physiology in clinical practice, as it is in the first year that a foundation towards a positive attitude to the subject can be laid.

2. Materials and Methods

This comparative cross sectional study was conducted in the Department of Physiology in RAK medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates.

A 15 item questionnaire was generated from available relevant articles obtained from indexed journals. The questions were close ended and the responses graded on a 5 point Likert scale ranging from 5=strongly agree to 1= strongly disagree. The number of questions was kept low to ensure maximum compliance.
For analysis the questions were grouped together under 3 main themes:
1. Status of physiology as a subject (Items 1,3,5,6,7,8,12,13)
2. Utility of physiology later in clinical fields (Items 2,4,9,14,15)
3. Physiology as a future career option (Items 10,11)

The questionnaire was validated for content by the faculty, pilot tested for reliability and suitable modifications were made. The internal consistency of the questionnaire was checked by the Cronbach’s Alpha which gave a value of 0.8.

Ethical clearance from the Institutional Ethics Committee was obtained and then the questionnaire was administered to both first year and final year medical students. Written informed consent was taken prior to administering the questionnaire.

Participation was voluntary and no incentives were given to the students. The questionnaire was administered to the students towards the end of their respective academic year.

The self-administered questionnaire was anonymous but participant characteristics including age, gender, nationality and year of study were collected.

2.1 Statistical analysis
An appropriate statistical tool (SPSS 17) was used to analyze the data. A comparison was done between the responses of the first year (n=80) and final year (n=23) students using the Kendall’s tau-b test with p value < 0.05 taken as significant.

3. Results
A total of 103 students returned the completed questionnaire (80 - Year 1 and 23 – Year 5) out of a total 136 students representing a response rate of 75.7%. 33(32%) were males and 70(68%) were females.

| Table 1: Year wise responses of students to individual items of the questionnaire pertaining to their perceptions and opinions towards the subject of Physiology |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| S. No | QUESTIONS | Agree strongly | Agree | Neutral | Disagree | Disagree strongly |
|     |                             | Yr1 | Yr5 | Yr1 | Yr5 | Yr1 | Yr5 | Yr1 | Yr5 | Yr1 | Yr5 |
| 1   | Physiology is an important subject of medical science | 48(60) | 21(91.3) | 26(32.2) | 2(8.7) | 5(6.3) | --- | --- | --- | 1(1.3) | --- |
| 2   | Studying physiology is relevant and beneficial in later clinical years | 49(61.3) | 20(87) | 22(27.5) | 3(13) | 8(10) | --- | --- | --- | 1(1.3) | --- |
| 3   | Physiology as a discipline has been neglected within the medical field | 14(17.5) | --- | 12(15) | 11(47.8) | 39(48.8) | 5(21.7) | 13(16.3) | 6(26.1) | 2(2.5) | 1(4.3) |
| 4   | Every good clinician requires a sound knowledge of Physiology | 43(53.8) | 13(56.5) | 27(33.8) | 9(39.1) | 8(10) | 1(4.3) | 2(2.5) | --- | --- | --- |
| 5   | Lack of clinical knowledge in a Physiologist makes the subject uninteresting | 31(38.8) | 5(21.7) | 35(43.8) | 11(47.8) | 9(11.3) | 6(26.1) | 5(6.3) | 1(4.3) | --- | --- |
| 6   | Rather than learning Physiology, medical students should concentrate on clinical sciences | 9(11.3) | 13 | 16(20) | 8.7 | 37(46.3) | 13 | 12(15) | 65.2 | --- | --- |
| 7   | Physiology is easy to study on my own | 9(11.3) | 3(13) | 21(26.3) | 3(13) | 27(33.8) | 7(30.4) | 16(20) | 9(39.1) | 7(8.8) | 1(4.3) |
| 8   | Physiology is more relevant if taught as an integrated curriculum with other clinical specialties | 20(25) | 9(39.1) | 28(35) | 10(43.5) | 26(32.5) | 3(13) | 4(5) | 1(4.3) | 2(2.5) | --- |
| 9   | Only a limited knowledge of physiology is required for satisfactory medical practice. | 6(7.5) | 1(4.3) | 14(17.5) | 2(8.7) | 26(32.5) | 2(8.7) | 26(32.5) | 14(60.9) | 8(10) | 4(17.4) |
| 10  | I would like to take up Physiology as a career choice | 6(7.5) | --- | 19(23.8) | --- | 28(35) | 14(60.9) | 13(16.3) | 13(16.3) | 14(17.5) | 1(4.3) |
| 11  | Teaching and explaining the concepts of Physiology to students will give as much satisfaction as treating patients | 20(25) | 3(13) | 28(35) | 9(39.1) | 23(28.8) | 8(34.8) | 8(10) | 13(16.3) | --- | --- |
| 12  | It is difficult to understand and retain physiology | 10(12.5) | --- | 20(25) | 2(8.7) | 33(41.3) | 10(43.5) | 12(15) | 8(34.8) | 5(6.3) | 3(13) |
| 13  | Time allocation of one year for teaching Physiology is not enough | 15(18.8) | 3(13) | 23(28.8) | 7(30.4) | 25(31.3) | 8(34.8) | 14(17.5) | 4(17.4) | 3(3.8) | 1(4.3) |
| 14  | Clinical cases can be solved easily using knowledge gained in Physiology | 17(21.3) | 7(30.4) | 37(46.3) | 9(39.1) | 20(25) | 7(30.4) | 5(6.3) | --- | 1(1.3) | --- |
| 15  | Physiology is necessary for understanding the presenting symptoms and signs of patients | 24(30) | 13(56.5) | 45(56.5) | 9(39.1) | 9(11.3) | 1(4.3) | 1(1.3) | --- | 1(1.3) | --- |

Yr 1: Year I students (n=80) Yr 5: Year 5 students (n=23). Results expressed as the number of students and percentage of students (in brackets) who gave a particular response on a 5 point Likert scale to each of the 15 items of the questionnaire.

3.1. Status of physiology as a subject
Almost all students from both first & final year agree that physiology is an important subject of medical science. The majority also disagreed with the statement that rather than learning Physiology, medical students should concentrate on clinical sciences. This underlines the fact that they think Physiology is an important subject in medical school. Again majority in both the groups felt that Physiology is more relevant if taught as an integrated curriculum with other clinical specialties and clinical knowledge in a physiologist would definitely make the subject more interesting. These results were more clearly emphasized by the final year students as evidenced by the statistical analysis.
3.2. Utility of physiology later in clinical fields

Again though almost all the students in both the groups (>85%) agreed that the study of Physiology is beneficial in later clinical years and that every good clinician requires a sound knowledge of Physiology, the first year students were seemingly less unconvinced about the utility of Physiology for satisfactory medical practice than the final years.

3.3. Physiology as a future career option

Surprisingly even though physiology was perceived positively by the majority of students, 60% of the final year and 35% of the first year students remained neutral to the idea of physiology as a satisfying career choice with almost 40% of the final years and 30% of the first years clearly replying in the negative.

4. Discussion

Medical education is currently undergoing innovative evidence-based changes in teaching and learning. More emphasis is being placed on student centered, integrated, problem based, clinically relevant teaching and learning. This is especially true in the teaching of basic sciences where the current trend is to convert the passive learning environment into one that encourages a more active participation from the students and promotes lifelong learning and love for the subject. The primary idea of the constructivism theory of adult education is that learners construct their own knowledge on the basis of what they already know, perceive and experience. This theory posits that learning is active, rather than passive, with learners making judgments about when and how to modify their knowledge.7-9

Social psychological and cognitive psychology researches have shown that behavior and learning is sometimes unwittingly and inadvertently influenced by the perceptions of an individual. Kaufman and Mann (2010) describing the Social cognitive theory say that "actions, learning and functioning are a result of a continuous, dynamic and reciprocal interaction among 3 sets of determinants; personal, environmental and behavioral. Personal factors include the individual’s attitudes, perceptions, values, goals, knowledge and all previous experience."10

All these researches underline the effect of perceptions and opinions on the inclination of the student towards the learning any subject. How medical teachers can improve the perceptions then becomes critical to the learning and understanding process of the students and the inclination towards that subject.

In our study Physiology as a subject was overall perceived positively by the students though the first year students were seemingly less unconvinced about the importance of Physiology and its utility in the clinical years. This perception could be due to the fact that the final year students had greater clinical exposure and so were more aware of the importance of physiology later in the clinical years. This was similar to the response in other studies where students exhibited a positive attitude to the subject although they were not willing to take it up as a career.11-16

Contextual teaching linking theory to real life situations is again crucial to impress upon the students the usefulness of a basic science subject in clinical years. This would also motivate the student to adopt a deeper approach to learning, resulting in the student interacting vigorously and critically with the course and focusing on the overall meaning. This is reflected in our study where students felt that the teaching of physiology would be more effective if taught in an integrated fashion.

Role models and the learning environment are critical to effective education of the medical students. The physician/teacher is the most powerful influence upon the standards of conduct and practice of every trainee, whether medical student or junior doctor. Role modeling may take place unconsciously and can profoundly affect student learning.19-20 Faculty members should be aware that they transmit their own perceptions about the subjects they teach, through their own behavior and attitudes, and should act accordingly.

Various diverse factors influence medical students’ choice of their eventual careers, including student demographics, lifestyle preferences, prestige, expected income, preclinical and clinical experiences, role models and alternate career opportunities.2-14 Our study reflects the trend among young medical students all over the world who do not consider any basic sciences subject as a career option. Inadequate job openings, poor research opportunities, lesser remuneration and poor role models in basic sciences were some of the main factors that were cited for the lower preference in other studies.21-24

Table 2: Statistically significant scores for items in the questionnaire dealing with the status of physiology as a subject

<table>
<thead>
<tr>
<th>Kendall's tau_b</th>
<th>Q1</th>
<th>Q6</th>
<th>Q8</th>
<th>Q12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>0.273**</td>
<td>-0.208*</td>
<td>0.176</td>
<td>-0.277**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.005</td>
<td>0.021</td>
<td>0.055</td>
<td>0.002</td>
</tr>
</tbody>
</table>

The responses between year 1 and year 5 were compared using Kendall's tau_b.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Statistically significant scores for items in the questionnaire dealing with the utility of physiology later in clinical fields

<table>
<thead>
<tr>
<th>Kendall's tau_b</th>
<th>Q2</th>
<th>Q9</th>
<th>Q15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>0.230*</td>
<td>-0.228*</td>
<td>0.227*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.017</td>
<td>0.012</td>
<td>0.017</td>
</tr>
</tbody>
</table>

The responses between year 1 and year 5 were compared using Kendall's tau_b.

*Correlation is significant at the 0.05 level (2-tailed).

Table 4: Scores for items in the questionnaire dealing with choice of physiology as a future career option

<table>
<thead>
<tr>
<th>Kendall's tau_b</th>
<th>Q10</th>
<th>Q11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>-0.131</td>
<td>-0.088</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.147</td>
<td>0.333</td>
</tr>
</tbody>
</table>

The responses between year 1 and year 5 were compared using Kendall's tau_b. No significant scores were reported.
5. Conclusion

Physiology as a subject and its utility in the clinical years was perceived positively by the students in our study, more so the final year students who had completed their clinical rotations, but the choice as a career option was low. Few students are interested in basic science subjects; hence the need to address this apathy in the medical curriculum is critical. We believe that rather than worrying about covering course content teachers must realize that inspiring, motivating and creating positive attitudes in students is critical. Only then will the students develop an interest and love for lifelong learning. The medical students are the end users of any teaching learning activity and are perfectly placed to give us the relevant feedback. This feedback about the student perceptions could be valuable to guide us to a better designing of the curriculum, faculty development and training in pedagogical approaches and a better teaching of physiology, which would then create a positive attitude among the students towards physiology, a lifelong love for the subject and perhaps an interest in pursuing it as a career.

6. Limitations of our study


References